

AMENDMENTS TO THE CLAIMS

The listing of claims below replaces all prior versions of claims in the application.

1. (Currently Amended): A rapidly solidified material consolidated into a bulk form for actuators and sensors, comprising a Fe-Ga magnetostrictive alloy which is obtained ~~[[from]]~~ by plasma sintering slices, a powder or chops ~~[[of]]~~ comprising a Fe-Ga alloy rapidly solidified material ~~by spark plasma sintering~~, the Fe-Ga alloy rapidly solidified material having a high temperature-side disordered bcc structure and a fine columnar texture by a liquid rapid solidification method, being in a disordered to ordered transition composition range, and containing 15 to 23 atomic percent of Ga with respect to polycrystalline Fe,

wherein the Fe-Ga magnetostrictive alloy retains the texture of the Fe-Ga alloy rapidly solidified material, and a magnetostriction of 170 to 230 ppm is obtained at room temperature by annealing after the sintering.

2-3 (Cancelled).

4. (Currently Amended): The rapidly solidified material consolidated into a bulk form for actuators and sensors, ~~according to Claim 1,~~ comprising a Fe-Ga magnetostrictive alloy which is obtained by plasma sintering slices, a powder or chops comprising a Fe-Ga alloy rapidly solidified material, the Fe-Ga alloy rapidly solidified material having a high temperature-side disordered bcc structure and a fine columnar texture by a liquid rapid solidification method,

being in a disordered to ordered transition composition range, and containing 15 to 23 atomic percent of Ga with respect to polycrystalline Fe,

wherein the Fe-Ga magnetostrictive alloy retains the texture of the Fe-Ga alloy rapidly solidified material, and a magnetostriction of 250 to 260 ppm is obtained at room temperature by annealing in a magnetic field following the sintering.

5. (Withdrawn): A rapidly solidified material consolidated into a bulk form for actuators and sensors, comprising a TiNiCu shape-memory alloy which is obtained from slices, a powder or chops of a TiNiCu shape-memory alloy rapidly solidified material by spark plasma sintering, the TiNiCu shape-memory alloy rapidly solidified material being composed of an amorphous to nanocrystalline texture or an amorphous and nanocrystalline mixed texture by a liquid rapid solidification method.

6. (Withdrawn): The rapidly solidified material consolidated into a bulk form for actuators and sensors, according to Claim 5, wherein the TiNiCu shape-memory alloy is $\text{Ti}_{50+x}\text{Ni}_{40}\text{Cu}_{10-x}$ (where x is in the range of 0 to 4 on an atomic percent basis).

7. (Withdrawn): A method for producing the rapidly solidified material consolidated into a bulk form for actuators and sensors according to Claim 1, comprising the steps of: forming a rapidly solidified material by a liquid rapid solidification method from a Fe-Ga alloy having a high temperature-side disordered bcc structure and a fine columnar texture, being in a disordered

to an ordered transition composition range, and containing 15 to 23 atomic percent of Ga with respect to polycrystalline Fe; forming slices, a powder, or chops from the alloy as a raw material; and performing spark plasma sintering of the raw material at an application pressure of 50 MPa or more and at a sintering temperature of 873K or more under conditions in which the pressure and the temperature are controlled so that the texture of the rapidly solidified material is not lost.

8. (Withdrawn): A method for producing the rapidly solidified material consolidated into a bulk form for actuators and sensors according to Claim 5, comprising the steps of: forming a TiNiCu shape-memory alloy rapidly solidified material which is composed of an amorphous to a nanocrystalline texture or an amorphous and nanocrystalline mixed texture by a liquid rapid solidification method; forming slices, a powder, or chops from the alloy as a raw material; and performing spark plasma sintering of the raw material at a temperature less than a recrystallization temperature of a TiNiCu shape-memory alloy.

9. (Withdrawn): The method for producing a rapidly solidified material consolidated into a bulk form for actuators and sensors, according to Claim 8, wherein the TiNiCu shape-memory alloy rapidly solidified material is wet-pulverized by rotary ball milling into slices, a powder, or chops.

10. (Withdrawn): The method for producing a rapidly solidified material consolidated into a bulk form for actuators and sensors, according to Claim 9, wherein the wet-pulverizing is

performed using an alcohol.

11. (Withdrawn): The method for producing a rapidly solidified material consolidated into a bulk form for actuators and sensors, according to Claim 8, wherein annealing is performed after the sintering.

12. (Withdrawn): The method for producing a rapidly solidified material consolidated into a bulk form for actuators and sensors, according to Claim 11, wherein the crystal orientation of alloy properties is enhanced by annealing in a magnetic field after the sintering, and the magnetic moment (magnetic domain structure) directly relating to the magnetostriction is controlled.